

FORCE Monitoring Program Continues in 2018

(Editor's note: In early March, South Cumberland News, asked FORCE if Kira Krumbansl could author an article concerning FORCE's monitoring program for the April issue and to supply a head and shoulder photo plus her name and position. The following article was provided, but photo, was not provided. The following got set aside and lost in the shuffle. We have since received the missing data. Our apology for the delay.)

By Kira Krumbansl and Melissa Oldreive

After many years of data collection without a turbine in place, we're now starting to collect some data during turbine deployment, operation, and retrieval. We're often asked "So, what's happening?" The short answer: it's too soon to draw any conclusions. Initial fish data analysis completed by the University of Maine did-

n't identify any significant changes in fish distributions at the FORCE site during the six months of turbine deployment in 2016-2017, but much more data is needed to strengthen this conclusion.

Similarly, initial analysis by Sea Mammal Research Unit (Consulting) found no evidence that marine mammals permanently avoided the site while a turbine was in operation, but there was a temporary decline during turbine installation activities.

Individual turbine companies also conduct a 'near-field' monitoring program, covering 100 metres around their device. In 2016-2017, this work was completed by Cape Sharp Tidal and focused on fish, marine mammals, and turbine sound. As this work evolves, integrating their near-field results with FORCE's mid-field

monitoring programs will be useful in understanding potential impacts from turbines in the Minas Passage.

There's definitely lots of work to do to improve environmental monitoring in high flows. It's really a new science. And the sector needs to provide clear, long-term evidence of how marine life interacts with the technology if it's going to move to larger scale. We've heard that from fishers, regulators, and other users of the Bay. And that will take time.

That's why - in terms of what FORCE is doing - we're focussed not just on our own mid-field monitoring programs, but also on using our 'FAST' subsea sensor platforms to advance our ability to get good data. For example, with funding we were awarded last fall by the Offshore Energy Research Association, Natural Resources Canada, and the Nova Scotia Department of Energy, we'll be integrating overlapping hydro-acoustic technolo-

gies - mobile fish surveys and FAST platform bottom-mounted data - to predict fish interactions with turbines in the Minas Passage.

But FORCE's work doesn't exist in isolation: turbines have been deployed in a number of regions globally, including the UK, France, and the USA. To date, results have been promising: negative impacts to marine life are minimal. And during this early stage of device testing, any impacts are likely to be small. In particular, findings in Annex IV State of the Science Report: Environmental Effects of Marine Renewable Energy [MRE] Development Around the World (2016) include:

"Based on the scale of ocean basins and coastal areas, the changes due to a small number of MRE devices will not be measurable", and

Preliminary analyses indicate that tidal farms "have very little system-wide effects even in the most complex marine systems"

But again, it's too soon to draw conclusions. Avoidance is much easier to observe in low



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sediment sites near the water surface, where it's easier to see. Testing these findings in the Minas Passage will take time; high flows, high sediment, high turbidity, and low light challenge traditional monitoring techniques. That's why we'll continue to also experiment with novel approaches to data collection

And so our work continues. Academic and research partners have included the University of Maine, the Sea Mammal Research Unit Consulting (Canada), Envirosphere Consultants, Acadia University, Luna Ocean Consulting, JASCO Applied Scientists, GeoSpectrum Technologies, Ocean Sonics, Nexus Coastal Resource Management.

In 2017, the monitoring program completed approximately: 130 hours of hydro-acoustic fish surveys; 11 days of lobster surveys using 48 traps; 334 days of C-POD data collection bringing the total to more than 1,300 C-POD days; bi-weekly beach surveys; 16

seabird surveys and four marine noise surveys.

Our data collection will continue in 2018, including marine mammal, fish, seabird, lobster, and acoustics monitoring programs. Over time, research teams should be able to make more definitive conclusions. Along the way, we'll continue to issue interim reports that summarize our monitoring activities.

The aim is to support FORCE's ongoing mandate to collect and share data on with regulators, industry, the scientific community and the public to better understand if in-stream tidal energy can play a safe, viable role in Nova Scotia's long-term energy mix.

If you'd like to read more, all of the monitoring reports to date are available online: <http://fundyforce.ca/environment/>

Dr. Kira Krumbansl, Marine Biologist and Melissa Oldreive, Research and Outreach Manager at Fundy Ocean Research Center for Energy (FORCE)



The costumes were fantastic. From left to right, Ryan Merriam (Toto), Rachel Kamphuis, Tanner Altenkirk. (Mary-Emma Barnhill Photo)

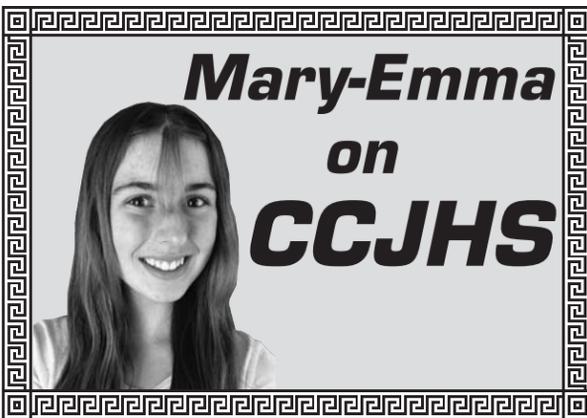


It took a lot of work and many practices, but the crowd enjoyed each performance. Top row, from left to right, Morgan Barnes, Jenessa Wolfe, Brianna Blaawendraat, Danielle Donkin, Jayme Slaney, and Lienna Storry-Trefry. Bottom row, Jenna Corbett (Wicked Witch). (Mary-Emma Barnhill Photo)



CCJHS students rehearsing for the OZ musical. From left to right, Abi MacKenzie (Tin Man), Peter Altenkirk (Cowardly Lion), Tanner Altenkirk (Scarecrow), and Rachel Kamphuis (Dorothy). (Mary-Emma Barnhill Photo)

CCJHS students heading to Ottawa



By Mary-Emma Barnhill

CCJHS's musical Oz was recently performed on April 10th and 11th. A big thank you to staff members Jacqueline Chambers, Erin Langille, Holly Hartlen, Stephanie Boertjes, Lydia Negus, Michael St. Peter, Brenda Morrissey, Joe Munro, Krista Crowe, Andrew Gaskin, Susan Smith, Brenda Ryan, Christine Caudle, Candace Westhaver, Melissa Harrison, Chad MacPherson and Glenda Hughes, as they were all involved in this production.

In May, two CCJHS students will get the opportunity to travel to Ottawa for the Canada-Wide Science Fair. Grade nine students Peter and Tanner Altenkirk will be staying in Ottawa from May 12th to May 19th with over 400 other students. Peter Altenkirk's project is on reading brain waves to create a device for people who are unable to speak

and Tanner Altenkirk's is on how training Grade Seven students in the

Method of Loci can lead to changes in their digit and word memory spans. Good luck boys!

Track and Field practices have begun at CCJHS. Practices are on Monday, Tuesday and Wednesday until 3:30. All students are welcome.

Mary-Emma Barnhill is a student at CCJHS and writes a monthly column on activities at the school



The cast of the musical. (Mary-Emma Barnhill Photo)

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